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International Nepal Himalaya Expedition for Lepidoptera Palaearctica (INHELP) 1977, Report No. 1: Introduction and Lycaenidae

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Abstract. Seven species of steppe and alpine Lycaenidae were collected during a 1977 summer expedition which visited 13 localities in the Thakkhola region of Central Nepal Himalayas. Climatic and geologic characteristics of the Thakkhola region plus habitat profiles of the collecting localities are described. *Albulina orbitulus asiatica* (Elwes), *A. lehana* (Moore), *Polyommatus stoliczkana arene* Fawcett, *P. nepalensis* Forster, and *Lycaena phlaeas baralacha* Moore were residents of the Palaearctic realm, while *Lampides boeticus* (L.) and *Rapala selira* (Moore) barely enter this zone from lower elevations. *L. phlaeas* and *P. nepalensis* extend down into the Oriental realm as well. The butterfly fauna of the Tibetan frontier adjacent to Sikkim and Bhutan to the east is very similar to the Thakkhola region, while the high mountain fauna further west and northwest of Nepal is quite dissimilar except for the Kumaon Himalayan-Tibet frontier. The Oriental realm occupies the subtropical zone below Thakkhola to the south.

Introduction

During the summer of 1977, Mr. Hans J. Epstein, the expedition leader, his sons Mark and Larry, and I explored steppe and alpine regions of Thakkhola, a high valley of the Kali Gandaki River, and the adjacent Manang and Sangda regions in Himalayan Central Nepal for Palaearctic butterflies. From June 1st to August 7th we collected between 2745 and 5395 m, covering about 965 km of main and minor trails in all. We were ably assisted by Sherpa guides (Danu, head Sherpa) and porters provided by Lt. Col. James Roberts of Mountain Travel, Khatmandu. An historical account of this rarely collected area, along with our papilionid and pierid results, has recently been reported by Epstein (1979a, b). The present report covers the Palaearctic Lycaenidae I collected on the expedition. (Epsteins' collections were for the same species and localities as reported here.) Although two species of Riodinidae and six species of Hesperiidae were encountered in the Oriental-subtropical zones during the expedition, none were seen in the Palearctic zone (Shields, 1981). Climatic, geologic, and biogeographic background information will be discussed.

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Climatic Regime of Thakkhola

Thakkhola is the high valley (>3050 m) of the Kali Gandaki River in Central Nepal, a glacial-fed river that originates north of the Himalayan Ridge in the semi-arid region of the Mustang Kingdom. The high, open basin cuts into the Tibetan Plateau and is bordered by two north-south ridges, nearly 6100 m in elevation. A series of tributary valleys, extending about 16 km, drains the ridges. Below this valley, the Kali Gandaki crosses the High Ridge from Dhumu to Dana and Tatopani in a narrow S-shaped gorge cut deeply between Dhaulagiri (8300 m) to the west and Nilgiri (7530 m) to the east. It then descends 1980 m in about 16 km, with the climate changing from Tibetan semi-arid (slopes north of the High Ridge) to Nepali monsoon tropical (south slope). Thereafter, the valley opens and the river flows southernly for about 50 km. Its tributaries drain all the glaciated south slope of the High Ridge (above from Krummenacher, 1971).

During the monsoon season (July to September), the moist air which reaches Nepal from the southwest is forced to rise when it meets the mountains, resulting in heavy precipitation on the southern sides of the Himalayas. Upper slopes around 2440 m are almost perpetually covered with drizzling mist and clouds. When the monsoonal air passes over the northern sides of the Himalayas, there is a pronounced rain-shadow effect. Early October to mid-December is the post-Monsoon or retreating southwest monsoon period. Winter lasts from December to March, when heavy snowfall occurs in the higher Himalayas. Spring extends from April to June (above from Banerji, 1952; Critchfield, 1966; Stainton, 1972).

A strong wind blasts through the gap between Daulagiri and Annapurna and on up the upper Kali Gandaki valley for most of the day, starting around 10 AM during the monsoon season. This wind clears the rainclouds from the center of the valley, while the sides of the valley above 4420 m are usually covered in mist.

In Central Asia, including the Himalayas, there were four glacial periods corresponding to the Mindel, Riss, Wurm, and post-Wurm stages in the Alps (Trinkler, 1930; Mani, 1968). Glaciation was extensive on the northern side of the Himalaya during the Pleistocene, where huge moraines encumbered all the northern valleys. In the Mt. Everest area, these north-side glaciers completely blocked most of the valleys and often were linked (Trinkler, 1930). On the Tibetan Plateau, glaciers were sporadic and small except in southeastern Tibet, and the highland was not covered with a cap of ice (Trinkler, 1930). Today, perpetual snowline in the Himalayas is 4875 m (5180 m in Nepal), and on the Tibetan Plateau it rises to 6100 m due to lack of precipitation. The lower limit of glaciers on Annapurna (south cirque of Annapurna I) is 3600 m, while their upper limit there is 5200 m (Vivian, 1970).

Geologic Setting of Thakkhola

Nine of the 14 world's tallest mountains, >8000 m high in elevation, occur in the Higher Himalayas of Nepal. Daulagiri (8172 m) is the sixth highest peak in the world. Tibet is the highest of the world's plateaus, averaging 4875 m. The Tibetan slab is an immense monoclinal structure dipping north. Based on indications from submarine volcanism and paleomagnetism, Middle Cretaceous-Eocene was the time when the Himalayan orogeny formed (Verma, 1973; Blow & Hamilton, 1975).

The Inner Himalayas, the region between the Great Himalayas and the Tibetan Plateau, are composed of Lower Paleozoic to Middle Cretaceous marine formations of the Tibetan Zone (Colchen, 1975). Towards the north this zone grades into the Tibetan Plateau across the Nepalese border. Formations of Thakkhola range in age from Precambrian to mid-Cretaceous (Krummenacher, 1971).

Most great rivers of the Himalayas have their source in the Tibetan Zone and cut across the Great Himalayan Range in deep gorges. Below Tukche, the walls of the Kali Gandaki gorge rise from about 2440 m to over 7925 m, making it perhaps the greatest canyon in the world.

A major N-S directed fault zone borders the west side of the Kali Gandaki valley. This fault has a maximum vertical throw of ≥2700 m; it sharply cuts all existing structures and is therefore post-orogenic.

Biogeographical Affinities

Elwes *et al.* (1906) describe the butterfly fauna from the Tibetan Plateau just north of Sikkim and Bhutan (mostly from Gyantze) which appears quite similar to that of the Thakkhola region. Indeed, both areas fall within Ward's (1935) "Outer Plateau" gravel lands botanical division of south-central Tibet. The Chumbi Valley on the Tibetan frontier of Sikkim (Elwes, 1882), about 480 km east of Thakkhola, exhibits a similar fauna to the Thakkhola region. Butterflies from the Kumaon-Tibet border NW of Nepal show close affinities to the Nepal Himalayas (see Champion & Riley, 1926). Other early papers on the Tibetan butterfly fauna include Fawcett (1904), South (1913), and Evans (1915).

In contrast (except for the adjacent Kumaon Himalaya), the butterfly faunas of the high mountains further to the northwest and west of Nepal, though having some species in common with Thakkhola, are fundamentally dissimilar, i.e. the north-west Himalaya (Mani & Singh, 1961-1962), western Karakorum (Evans, 1927), Alai-Pamir (Forster & Rosen, 1940), Baluchistan (Evans, 1932), Afghanistan (Clench & Shoumatoff, 1956; Wyatt, 1961), and West Pakistan and Iran (Shirozu & Saigusa, 1963). Most species of Lepidoptera from Northwest Himalaya are also found in the Pamirs and other Middle Asiatic mountains (Mani, 1968, p.220). This biogeographic division is termed the Turkmenian subregion of the Palaearctic realm and extends over Transcaspia, Turkestan, the Higher

Fig. 1. Butterfly faunal provinces of Southeast Asia. Arrows indicate the initial spread from an Upper Burma-Yunnan-Szechwan center of origin.

Himalayas along the south slopes (above treeline), Tibet, Sinkiang, Mongolia, and southernmost West Siberia (Mani, 1962, 1974). However, the Mongolian butterfly fauna differs markedly from the central Himalayas (see Elwes, 1899; Forster, 1965). Mani (1968, p. 228) sets off Northwest Himalaya, Karakorum, and the Alai-Pamirs as a distinct biogeographic subunit of the Turkmenian. The bulk of the Indian butterfly fauna proper is derived from the Oriental tropics (Holloway, 1969, 1974) (see Figure 1).

The southern boundary of the Palearctic extends to the southern slopes of the Himalayas, between 2440-3660 m in the N.W. Himalayas, gradually rising to 3660-4575 m in the east (Seitz, 1923; Riley, 1927). Tree-line or slightly below tree-line is probably a more realistic boundary in the Thakkhola region.

The alpine flora of the Himalaya is closely related to the alpine flora of eastern Tibet and western China (Kitamura, 1955). In Nepal, the East Himalayan floral elements merge with the West Himalayan elements (Banerji, 1962, 1973), at least in the Oriental realm (Bhatt, 1964). The Thakkhola-Manang regions lie in the Eastern Himalaya in Banerji's scheme but close to this 83° Longitude merging line. We found some basic differences in various butterfly subspecies on the east and west sides of the Kali Gandaki in the Thakkhola region, also in support of this boundary.

The highest known angiosperms collected in Nepal are from just below 6000 m (Webster, 1961).

Lycaenid Localities (Table 1 and Figure 2)

1. *Just north of Jhomosom, 2800 m (Camp 1)*

Sophora moorcraftiana Benth. ex Baker var. *nepalensis*, a pioneer on the steep slopes and new soil along the Kali Gandaki, is the dominant steppe shrub. Also prominent here was *Ephedra gerardiana* Wall. ex Stapf. This was a very dry, windy valley, like a desert. Jhomosom averages only 270-295 mm rainfall.

2. *Between Jhomosom and just south of Kagbeni to Dangarjong, 2760-3140 m (Camp 2 at Dangarjong) (Figure 3)*

The trail between Jhomosom and Kagbeni passes along present-day alluvium. *S. moorcraftiana* and *E. gerardiana* occur along the Kali Gandaki, and *Juniperus walliciana* Hook. f. et Thoms. ex Parl. in DC grows sparsely on the hillsides. *Thymus linearis* Benth. was abundant south of Dangarjong, but we found no lycaenids on it. The Jhomosom, Kagbeni and Dangarjong villages themselves are under cultivation.

3. *Pass region 8 km NNW Dangarjong, 4000-4400 m (Camp 3)*

We extensively collected in the basin area with rolling hills 1½ km west of this pass. Alpine meadows are found above treeline, above a zone of *Betula utilis* D. Don and conifer forest in Sangda Valley. Plants here were grasses, *Lonicera spinosa* Jacq., *Sedum*, *Polygonum*, small purple *Aster*, and many other alpine flowers. The area has been extensively grazed by goats and yaks but was a rich collecting site nevertheless.

4. *1½-3 km SE Sangda, 4100-4300 m (Camp 5)*

We collected in a broad canyon below a limestone ridge and on grassy ridge slopes, south above Sangda Valley. Alpine flowers included pink and white *Polygonum*, yellow *Potentilla* bushes, white edelweiss, and white

Table 1. Species Collected vs. Localities

SPECIES	LOCALITIES												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Albulina orbitulus asiatica			X	X	X	X						X	X
Albulina lehana							X		X	X	X		
Polyommatus stoliczkana arene								X		X			
Polyommatus nepalensis	X	X	X		X	X							X
Lampides boeticus	X					X							
Lycaena phlaeas baralacha		X				X	X	X	X				X
Rapala selira		X											

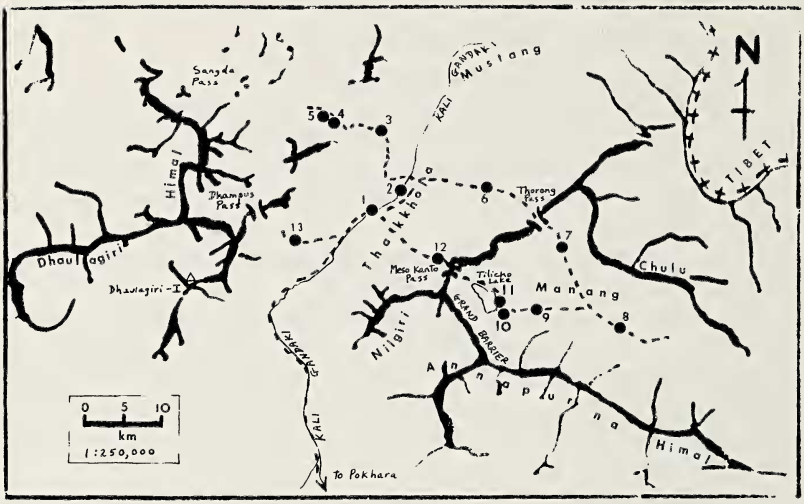

Fig. 2. Map showing our 13 collecting localities in the Thakkhola, Sangda, and Manang regions. Glaciers are stippled.

Fig. 3. Kali Gandaki River Valley with Annapurna in background.

Saxifraga. Upper talus slopes were nearly devoid of vegetation except for *Saxifraga*. The area was very windy at times and heavily grazed by goats, yaks and horses.

5. *1½ km SW Sangda, 3600 m (Camp 4)*

Tibetan steppe vegetation of *Caragana gerardiana* Royle and *Artemisia* grows here on shale.

6. *Just below sanctuary of Muktinath, 3600-3700 m (Camp 6)*

Tibetan steppe vegetation near cultivation was characterized by *Ranunculus, Potentilla, Geranium, Stellera, Primula, Thymus, Populus ciliata* Wall. ex Royle and thickets of *Spiraea* and *Lonicera*.

Fig. 4. Marsyandi River Valley of Manang.

7. *3-10½ km SE Thorong Pass, 4200-4900 m (Camps 8 and 9)*

We collected mostly in Jargeng Valley, which consists of limestone. Lush habitat occurred in places along the river, with some alpine meadows and bare rockslides above timberline. Alpine plants included grasses, sedges *Gentiana, Primula, Pedicularis, Campanula, Lactura, Brassica, Convolvulus, Rumex nepalensis* Spreng., *Heracleum, Iris, Ribes, Oxytropis*. Thorong Pass is at 5345 m.

8. *Manang (3500 m) to valley and slopes 5 km ESE Manang (3370-3700 m) (Camp 11) (Figure 4)*

The valley of the upper Marsyandi River is covered by an open xerophile forest of pines (*Pinus griffithi* McClelland in Griffith) and junipers (*Juniperus squamata* D. Don, *J. communis* L., *J. wallichiana*). On

Annapurna III above Braga, this open forest creeps up to 4100 m where it changes into a dense *Abies* forest, with alpine vegetation above the *Abies* forest. The extensively cultivated valley consists of alluvial deposits and alluvial fans. Other plants in the region include *Ranunculus hyperboreus* Rottb., *Populus suaveolens, Lonicera myrtillus* Hook. f. et Thoms., *Pyrus, Vibernum, Oxytropis williamsi* Vass., *Crataegus, Potentilla* and *Rosa sericea*. Vegetation of the Marsyandi basin is lusher than the arid Kali Gandaki basin. In the Marsyandi, the winds are not nearly as strong, and rainfall is much more frequent during the summer monsoon than in the Kali Gandaki.

9. *6½ km W. Khangsar, upper end Khangsar Valley, 4500 m (Camp 14)*

We camped here for 6 days in early July, in rolling alpine pastures on limestone filled with flowers and grasses above timberline. Flowers included a small purple *Aster,* legumes, purple *Viola,* a few *Sedum, Rumex, Rheum spiciforme* Royle, *Ranunculus*, strawberry, and pink *Polygonum*. Usually there was very little sun here in early July.

10. *8 km W. Khangsar, 4000 m (Camp 15)*

We camped where three rivers converge. Many different alpine plants grew here on limestone, including *Heracleum, Polygonum, Betula*, bush *Lonicera*, yellow sunflower, grasses, purple Azalea, orchid, purple *Aster*, chives and *Berberis*.

11. *SE slopes above Tilicho Lake, 4860 m (Camp 16) (Figure 5)*

This isolated lake is located on the N. side of Nilgiri and is surrounded on the south by glaciers. Sparse alpine vegetation of *Sedum*, pink *Polygonum*, purple *Aster*, purple *Gentiana* and some grasses was noted on limestone.

12. *"High Camp", NW below Tilicho Pass, 4420 m (Camp 17)*

This camp had alpine meadows and dells filled with pink *Polygonum* and purple *Aster*. We followed the North Thini Valley between here and Jhomosom.

13. *5-5½ air km W. Marpha, 3850 m (Camp 22)*

We camped and collected at treeline at the NW corner of old, man-made terraced fields surrounded by grassy-juniper slopes. A complex assortment of alpine and temperate forest plants grew here: *Juniperus, Sedum, Thymus linearis, Nepeta leucophylla* Benth., white *Heracleum,* orange crucifer, small and bush purple *Aster*s, two yellow composites, *Artemisia,* yellow *Trifolium*, pink scroph, grasses, *Salix,* red thistle, various field weeds, *Rosa*, conifer and hardwood groves and beech. This locality was rich in butterfly species and flowers with recent glaciations.

Along the Kali Gandaki between Marpha and Lete, there is a *Pinus excelsa* Wall. ex D. Don forest, then 4 km S. of Ghasa starts a broadleaved trees-pine forest, and then the humid, subtropical monsoon forest (Figure 6). Thus in the space of 24 air km S. of Jhomosom to the entrance of the Dhauagiri-Annapurna gap, only about a 915 m drop in elevation, one

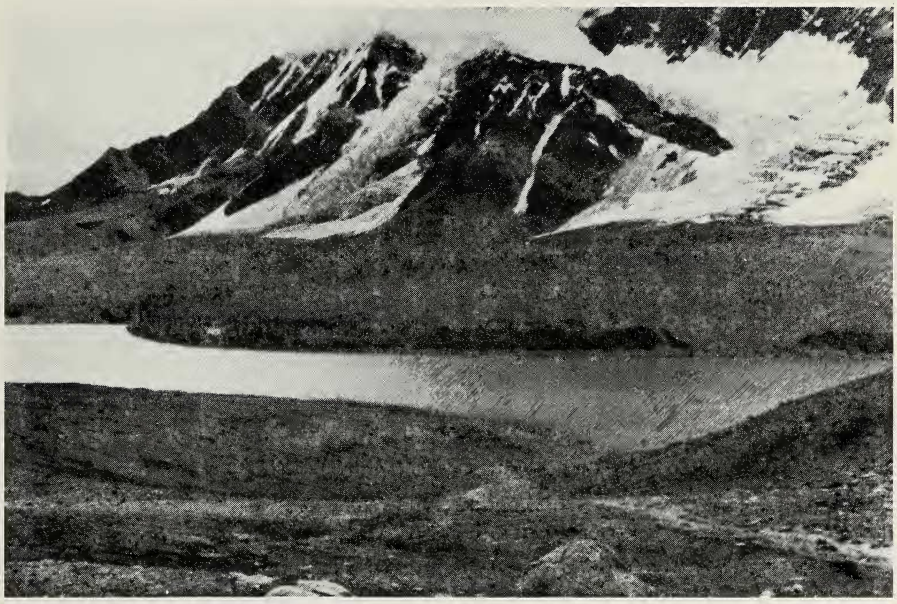

Fig. 5. The Tilicho Lake locality.

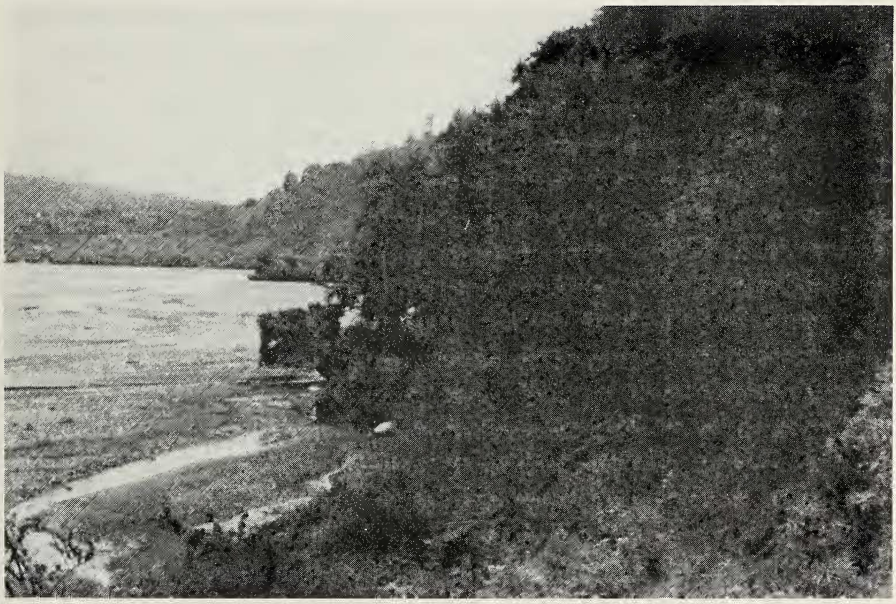

Fig. 6. Subtropical monsoon forest, 24-32 km SW of Marpha.

passes abruptly from Tibetan steppe (Palaearctic realm) into the subtropics (Oriental realm). The transition is much less marked on the valley sides. The butterflies we encountered in the subtropical forest habitat and hardwood trees-pine forest habitat from Kalopani (2440 m) southeast to Pokhara were endemic to the Oriental realm (Shields, 1981). *Rapala selira* (Moore) appears to be a resident just within the Palaearctic realm, while *Lycaena phlaeas* (L.) and *Polyommatus nepalensis* Forster extend down into the Oriental realm.

One additional, Oriental species, *Celastrina dilectus* (Moore) was taken as a fair condition male 4 miles west of Khangsar, 4500 m, July 9. This is doubtless a stray from lower elevations where it is known from the Himalayan foothills from Simla to Nepal.

Lycaenidae Collected

1.) **Albulina orbitulus asiatica** (Elwes), 69♂♂ 19♀♀; localities 3, 4, 5, 6, 12, 13; flight in mid June, July.

Males sometimes formed mud puddle clubs of 4-6 individuals. We found a light green pupa under a rock on June 15th that emerged on July 4th, 8-9½ km NNW Dangarjong. Elevation range: 3600-4420 m.

A. orbitulus is found in the Pyrenees and the European Alps at high altitudes, southern mountains of Norway, Lapland, Scandanavia, Asia Minor, the Balkan, Persia, Altai Mts., and Himalaya Mts. to Tibet, north-central Mongolia, Turkestan, China, and south Siberia as far as Kamtchatka as subspecies or possibly closely related species (Elwes, 1899; Seitz, 1906; Forster, 1965; Higgins, 1975). It is also found in the Amur region (Mani, 1968). *A. pheretes* Hubn. is a synonym (see Beuret, 1933) and occurs in Tarbagatai, Central Asia. *A. o. asiatica* (Elwes) is found at high elevations in the northeast corner of Nepal (Riley, 1923; Fujioka, 1970) and Sikkim (Mani, 1968). Elwes *et al.* (1906) consider ssp. *pharis* Fawcett to be a synonym of ssp. *asiatica* and record it from Tungu, Khamba Jong, and Lhanak Valley, Tibet. *A. o. pharis* (TL = Khamba Jong, 4575 m, Tibet, Fawcett, 1904) is recorded from Phari, 4875 m, and Tinki La, 4725 m (Riley, 1927). Unspecified subspecies of *A. orbitulus* are found at Girthi Valley, Shibchilan, Chojan and Lal Pahar (Champion & Riley, 1926), Po Chu Valley and Gyala (Evans, 1915), and Tiong la, Zhasha-la, Drowa Gompa, Pugo and Di Chu (South, 1913), all in Tibet. Forster described ssp. *lobbichleri* from only two worn specimens from Thakkhola; fresh specimens have the greenish gloss to the underside characteristic of *asiatica*, so *lobbichleri* is likely a synonym.

2.) **Albulina lehana** (Moore), 16♂♂ 3♀♀ plus 23 others; localities 7, 9, 10, 11; flight in late June to mid July.

Adults flew in meadows, came to moisture, and three were found 10½ km SSE Thorong Pass on a large purple *Aster* sp. in meadows in the early morning before it rained. Elevation range: 4000-4860 m.

A. lehana was described from Leh, 3515 m, Ladak (Moore, 1878, p. 230) and is found in Chitral-Kumaon over 3660 m (Cantlie, 1963), Kashmir (Mani & Singh, 1962) and the Pamirs and Kighizia (Korshunov, 1972). Elwes *et al.* (1906) claim that the West-Tibetan form is *lehana*. Lowndes (1953) records it ("nr. *pheretes*") from Manangbot, 3810 to 4875 m, Nepal, July. As *orbitulus* and *lehana* occur allopatrically in the Thakkhola region, they are probably separate species.

3.) **Polyommatus stoliczkana** nr. **arene** Fawcett, 53♂♂ 22♀♀; localities 8, 10; flight in late June to mid July, early August.
40 adults were taken in late June, all flying around *Oxytropis williamsi* Vass. (det. by A. O. Chater, BMNH) with rose-purple flowers and light, hairy leaves. Two females oviposited on the leaf venter at 8:30 and 10:30 AM. One *in copulo* pair (male carried female) was taken at 9:30 AM. Specimens were fresh to worn and did not visit mud; most alighted on the flowers and leaves of the foodplant. *Oxytropis* grew mostly on old stream alluvium, i.e. on flats. At 5 km ESE Manang, a dozen adults were taken in close association with *O. williamsi* growing on flats near pines, some feeding on the flower-heads.

We observed this species generally between Manang and Khangsar. One male was taken 16-19 km SW Marpha (est. 2560 m) in a Thyme-legume area of a dry river bed. Elevation range: 2560-4000 m.

This is the "*Eumedonia chiron jermyni*" of Forster (1961). Nominate *jermyni* is found from Chitral to Gilgit (Cantlie, 1963). *P. stoliczkana* was originally named from Ladak. The species is quite variable in size and undersurface markings. According to Mani (1968), it extends from the Northwest Himalaya to the Sikkim-Himalaya, and is represented by the ssp. *hunza* Gr.-Gr. on the southeast Pamir and in the Great Pamir, at elevations of 3870-4725 m. It is also found in the Western Karakorum (Evans, 1927). *P. s. janetae* Evans occurs in Karakorum, Khupjerah, Gujerab and Baturu (Wu, 1938), and ssp.*ariana* Moore is found in North India and southern Kashmir (Seitz, 1906). *P. stoliczkana* has been taken at Sanga Chu Dzong, southeastern Tibet, 3660 m, in June (South, 1913). Riley (1923) reports it common between June 18 and August 12 from 3960-4570 m on Mt. Everest. Elwes *et al.* (1906) give Gyantze and Khamba Jong, Tibet, as localities. Evans (1915) records it from Po Chu Valley and Tsang Po, Tibet, from July to September. In Nepal, Lowndes (1953) says it was common in grassy places and among junipers in Manangbot, 3500-4570 m, in July. Shirozu (1955) records it from Annapurna Base Camp to Chame in late May and early October, above 2500 m. The Nepal material we collected agrees with the description and figure of ssp. *arene* Fawcett (TL = Khamba-Jong, 4570 m, Tibet) (Fawcett, 1904; Seitz, 1906).

4.) **Polyommatus nepalensis** Forster, common (no exact tally); localities 1, 2, 3, 5, 6, 13; flight in early to mid June, late July to mid August.

Between Jhomosom and 1½ km S. Kagbeni, many were taken in early June, always around the blue-flowering *Sophora moorcraftiana* var. *nepalensis* bushes. One *in copulo* pair was on *S. moorcraftiana*, male carried female, at 8:00 AM. Just below the sanctuary of Muktinah (3600 m), one female displayed preoviposition behavior on a young, flowerless *Lonicera spinosa* bush (no *Sophora* here). At 5½ km W. Marpha (3700-3850 m), adults were in association with *Thymus linearis* Benth. and *Nepeta leucophylla* Benth. (both det. by J. R. Press, BMNH), in a *Rosa-Juniperus-Artemisia* area. Sometimes freshly emerged males were found at mud. We collected a few *P. nepalensis* in the hardwood-pine zone between Kalopani and Lethe, and between Kalopani (2440 m) and Ghasa (2010 m), in August. Elevation range: 2010-3900 m.

Shirozu's (1955) *Polyommatus eros ariana* Moore from Tukucha-Jhomosom and nr. Muktinath is probably this species (he doubted the original identification). Wadhi and Parshad's (1968) *P. icarus fugitiva* Butl. is also suspect, from Tukcha, Marpha and Dana in April. Forster (1961) says *P. nepalensis* stands near the species *everesti* Riley (1923) and may be only a subspecies of it.

5.) **Lampides boeticus** (L.), 3♂♂; localities 1, 6; flight in June, late July.

This species is strongly migratory in the west, a resident of S. Europe and N. Africa, Ceylon, India, Pakistan, Nepal, SE Tibet, Szechuan, Andamans, Nicobars, Burma, Australia, Tasmania, Lord Howe Island, etc. It was scarce in the Thakkhola region. There are no recognizable subspecies within its vast range. It is known to use many legumes as foodplants.

6.) **Lycaena phlaeas baralacha** Moore, 62♂♂ 22♀♀; localities 2, 6, 7, 8, 9, 13; flight in mid June to mid August.

Adults were sometimes found along streams. Two males 6½ km SE Thorong Pass, at a bridge, were very territorial. Adults were also taken in the hardwood-pine zone ca. 24-32 km SW Marpha (2550 m), between Kalopani and Lethe (2530 m), and between Kalopani (2440 m) and Ghasa (2010 m). Elevation range: 2010-4500 m.

According to Ford (1923), *baralacha* (TL = Baralacha Pass, 4875 m, Ladak) is perhaps a race of *stygianus* Butler. Distinguishing features between these two are slight and depend upon the amount of FW brown suffusion (more intense in *baralacha* than in *stygianus*). *L. p. baralacha* occurs in the Outer Himalayas (Kashmir-Kumaon), and Nepal, where it is common (in Evans as *phlaeas indicus*) (Cantlie, 1963). *L. p. stygianus* inhabits Baluchistan to Chitral and Ladak (= *eleus* F.; *timeus* Cr.) (Cantlie, 1963). *L. p. flavens* Ford is found in the Interior Himalayas to Sikkim and SE Tibet; it is large, with scanty brown suffusion (Cantlie, 1963). Wadhi and Parshad (1968) report *L. p. baralacha* (= *indicus*) from Lethe, Tukcha, and nr. Muktinath, Nepal. H. J. Epstein (*in litt.*) compared the

Thakkhola material with the British Museum collection and concludes it is best placed as *baralacha*.

7.) **Rapala selira** (Moore), 9 specimens, cal. 1½ km N. Dangarjong, 3140 m, 3 June 1977.

Mostly fresh specimens were collected in a thicket at the outskirts of cultivation. This locality is Quaternary alluvia (loess and broken rock).

Nominate *selira* was described from Kashmir (Moore, 1874). It is found in the Western Himalayas, Chitral to Kumaon, Nepal, and Tibet, and is common (= *roana* Fruh. In Evans it is listed as *micans selira*, but *micans* is now regarded as a Chinese ssp. of *nissa*) (Seitz, 1906; Cantlie, 1963). It flies in April-June, between 1220-2745 m (Wynter-Blyth, 1957). The Dangarjong locality may be a new altitude record (3140 m). Wadhi and Parshad (1968) found this species at Marpha and Jhomosom in late April and early May. The foodplant is *Indigofera purpurea* (Leguminosae) (Sevastopulo, 1973).

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